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THESIS

**ACTIVITY-BASED COSTING
OF THE PRESIDIO OF MONTEREY'S
FEDERAL POLICE FORCE**

by
Clyde Dopheide

December, 1997

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ACTIVITY-BASED COSTING OF THE PRESIDIO OF MONTEREY'S FEDERAL POLICE DEPARTMENT

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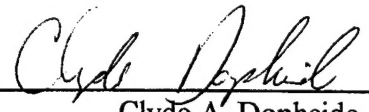
Author: 
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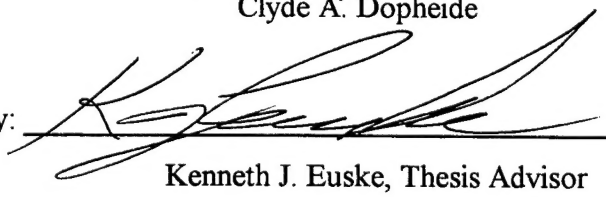
Approved by: 
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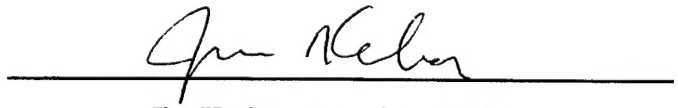
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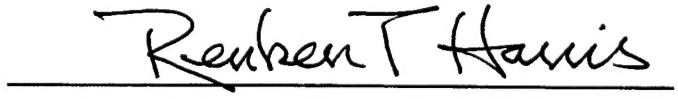
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ABSTRACT

The Army's current activity-based costing model, called Service Based Costing, focuses on costing Major Commands (MACOMS) and large installations. The Army has yet to develop an activity-based costing model for smaller organizations. This thesis develops an activity-based costing model for a small army organization, the Presidio of Monterey's Law Enforcement Command (LEC). This study arrived at the model by analyzing the LEC to determine the LEC's products, processes/activities needed to produce those products, and the resources consumed by processes/activities while producing products. The model identifies seven major products produced by the LEC and their associated costs. These products are Police Information, Police Patrol Service, Investigations, Crime Prevention Education, Crime Watch Hot-line, Physical Security Inspections, and Magistrate Support.

TABLE OF CONTENTS

I. INTRODUCTION.....1

A. OBJECTIVE.....1

B. BACKGROUND.....1

C. PRIMARY RESEARCH QUESTION.....2

D. SCOPE AND LIMITATIONS.....2

E. ORGANIZATION OF THE STUDY.....3

II. THE LAW ENFORCEMENT COMMAND AND ITS BUDGET.....5

A. OVERVIEW.....5

B. ORGANIZATION.....7

C. THE LEC'S BUDGET.....8

D. OTHER COSTS.....11
1. The Department of Logistics.....11
2. The Department of Public Works.....12
3. The Department of Resource Management.....13
4. The Department of Contracting.....13
5. The Department of Information Management.....13
6. The Civilian Personnel Office.....14
7. The Staff Judge Advocate.....14

III. THE LEC ACTIVITY-BASED COSTING MODEL.....15

A. ACTIVITY-BASED COSTING MODELS.....15

B. THE LEC MODEL, ASSUMPTIONS AND LIMITING FACTORS.16

C. PRODUCTS.....16

D. ACTIVITIES/PROCESSES.....17
1. Producing blotter report.....18
2. Answering requests for police information..18
a. Background checks.....19
b. Other requests for information.....19
3. Providing police services.....20
4. Police Operations.....21
5. Investigating.....21
6. Physical security inspections.....22

7. Crime prevention education.....23
8. Crime watch hot-line.....23
9. Magistrate court support.....24

E. RESOURCES.....24
1. Resources supplied by the other support divisions.....25
a. DPW's costs drivers.....25
b. DOL's cost drivers.....27
c. DRM's cost drivers.....28
d. CPO's cost drivers.....29
e. DOC's cost drivers.....29
f. SJAG's cost drivers.....30
g. DOIM's cost drivers.....31
2. Internal resources consumed by the LEC.....31
a. Police Chief's resources provided and cost drivers.....33
b. Police Chief's secretary's resources provided and cost drivers.....33
c. ADP's resources provided and cost drivers.....34
d. Physical Security's resources provided cost drivers.....35
e. Supply's resources provided and cost drivers.....36
f. Investigations' resources provided and cost drivers.....37
g. Deputy Police Chief's resources provided and cost drivers.....38
h. Training officer's resources provided and cost drivers.....41
I. PAC's resources provided and cost drivers.....43
j. Maintenance's resources provided and cost drivers.....44
k. Shift supervisors' resources provided and cost drivers.....45
l. Station commanders' resources provided and cost drivers.....45
m. Patrolmen's resources provided and cost drivers.....46
n. Dispatch's resources provided and cost drivers.....47
o. Animal control's resources provided and cost drivers.....48

F. COST FLOWS.....48

IV. CONCLUSION AND RECOMMENDATIONS.....53

A. COSTS OF PRODUCTS 53

B. LEC ISSUES, RECOMMENDATIONS 54
1. Issue: Station Commanders 55
2. Recommendation 56
3. Issue: Typing Police Reports 56
4. Recommendation 57

C. DISCUSSION 58
1. A Problem with Army Service Based Costing ..58
2. Potential Research and data errors 59
3. The Cost of Supporting CID 59

D. RECOMMENDATIONS FOR FURTHER RESEARCH 60

APPENDIX A. LEC PROCESS FLOW DIAGRAMS.....61

APPENDIX B. ACCOUNTING SPREADSHEETS.....67

LIST OF REFERENCES.....83

INITIAL DISTRIBUTION LIST.....89

I. INTRODUCTION

A. OBJECTIVE

The United States Army, along with the rest of DoD, is slowly moving towards using activity-based costing methods to more accurately identify the cost of doing business. The Army's current activity-based costing model, called Service Based Costing, focuses on applying costs at the Major Commands (MACOMS) level as well as large installations. The Army has yet to develop an activity-based costing model for smaller organizations. This thesis develops an activity-based costing model for a small organization, the Presidio of Monterey's Law Enforcement Command.

B. BACKGROUND

The Presidio of Monterey is a small Army Installation with the responsibly of supporting 42 internal and fourteen tenant organizations. Part of that support is providing police protection to the installation. The Presidio's Federal Police Department, called the Law Enforcement Command (LEC) or Directorate of Law Enforcement (DLE), has the largest number of employees of any base support department (54 employees). The mission of the LEC is to preserve the peace, provide security, and maintain law and order within the Presidio of Monterey

C. PRIMARY RESEARCH QUESTION

The primary research question of this thesis is, what is the total cost of running the LEC? This study answers this question by building an activity-based costing model that identifies:

1. The LEC's outputs.
2. The activities required to generate those outputs.
3. The cost drivers of each activity.
4. The resources consumed by the activities.
5. The cost flows of those resources.

D. SCOPE AND LIMITATIONS

This study develops an activity-based costing model for the LEC. It does not develop an activity-based costing model for the entire Presidio. As a result, the costs of providing support to the LEC from the Presidio's other base support divisions are estimated. Additionally, the model does not capture any of the general and administrative (G&A) costs of the installation's command group. However, given the large number of internal organizations, 42, the LEC's share of G&A cost is likely to be less than five percent of the LEC's total cost and thus immaterial.

The LEC's activity-based costing model developed in this thesis is based on field research. The activities, processes, and products were identified by observing the LEC over a two month period and by conducting numerous

interviews with LEC employees during that time. The LEC's costs were identified by reviewing FY97 financial data, and by interviewing managers of the various Presidio support departments that provide the LEC services.

Because Presidio base support organizations do not charge any of the internal organizations for support, they generally do not track the costs of providing that support. As a result, most of the costs traced from other base support departments to the LEC are estimates based on a combination of financial data and management input. This does not effect the accuracy of the cost flows, but does effect the accuracy of the final costs per product and the overall cost of running the LEC.

E. ORGANIZATION OF THE STUDY

This study is organized into four chapters. This first chapter is a brief introduction that discusses the purpose of this thesis. The second chapter provides an overview of the LEC's budget and the costs of support provided to the LEC by the Presidio's other base support departments. The third chapter is a detailed discussion of the LEC's activity-based costing model. The fourth, and final chapter, gives conclusions, two recommended LEC organizational changes, and recommendations for further study.

II. THE LAW ENFORCEMENT COMMAND AND ITS BUDGET

A. OVERVIEW.

The mission of the LEC is to preserve the peace, provide security, and maintain law and order within the Presidio of Monterey (POM) and the POM annex, an area greater than 29,000 acres. Because it must patrol such a large area, the LEC is the POM's largest base support division, in terms of number of employees and size of its payroll. The LEC currently employs 54 people and had a total payroll for FY97 of $2,409,694.65. The police force also has a fleet of twenty vehicles, a police station, and a police substation as major assets to help it accomplish its mission.

The Law Enforcement Command produces seven major products: Police Information, Police Patrol Service, Investigations, Crime Prevention Education, Crime Watch Hot-line, Physical Security Inspections, and Magistrate Support. Any one Uniformed Police Officer can be involved in producing all of these products, or the individual may only be involved in a few of these activities.

Providing Police Information encompasses the writing of reports, inputting those reports into a database, passing those reports to commanders, and conducting database searches in response to background/insurance checks. Police

Patrol Services comprise everything that a patrol officer does to support and protect the community that is not directly involved in producing another product. Investigations are those police activities used to attempt to solve crimes. Crime Prevention Education includes setting up information booths at community events, going to visit grade school classes, and similar activities. The Crime Watch Hot-line is updated bi-weekly and lists the crimes that happened on the Presidio over that two week period as well as giving crime prevention tips on how to stop/avoid various crimes. Physical Security Inspections are conducted every eighteen months on all tenant organizations to ensure that they are in compliance with U.S. Army regulations. The last product the LEC produces is support to the U.S. District Magistrate when he holds court. The LEC provides the court a uniformed Bailiff, an administrative assistant to collect any fines imposed, and Officers to testify at trial if needed.

When Fort Ord was open and the 7th Infantry Division was stationed there, the LEC was a much larger force. It had 151 military personnel and 138 civilian employees assigned, for a total of 289 employees. This number included post gate guards and a military police working dog (K-9) section. Currently, these two functions, providing gate guards and K-9 support, have been cut from the LEC

mission. Additionally, the physical security section is down to one physical security specialist, and the investigations section has been reduced from 15 to six employees. This legacy of being a much larger organization helps explain some of the support/overhead personnel in the current organization.

B. ORGANIZATION.

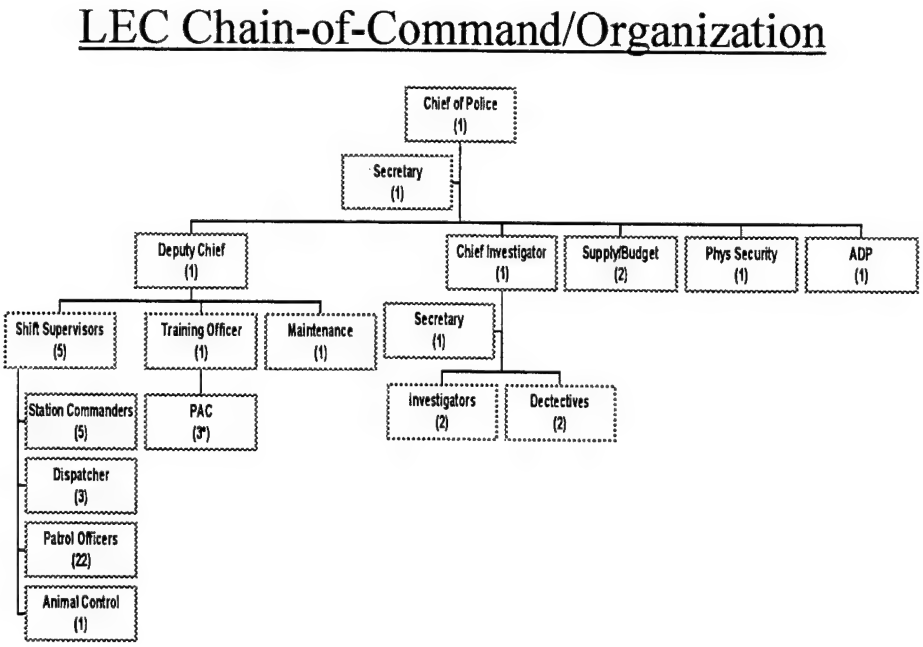


Figure 2.1. LEC's Organization.
The number in parenthesis is the number of employees assigned to that position. The asterisk indicates one employee falls under the Occupational Workman's Compensation Program and his salary is not paid by LEC.

The Chief of Police reports directly to the Presidio's Commander and is a GS-13, roughly the civilian equivalent to an army Lieutenant Colonel. Directly under the Chief is the

Deputy Chief of police who is responsible for running routine police patrol operations, the Chief Investigator who is responsible for investigating criminal offenses, the supply section which keeps track of the LEC's budget as well as ordering equipment and supplies, the Physical Security Specialist who conducts physical security inspections and provides the command with crime prevention training, and the Automated Data Processing (ADP) Technician who maintains the computer systems.

The Deputy Chief of Police is in charge of patrol operations. All the sworn uniformed police are assigned to him. These police officers conduct all police operations except for criminal investigations. Additionally, the Deputy Chief is responsible for the Police Administrative Center (PAC). The PAC is a section of three employees who are responsible for inputting and retrieving data from the police information data base.

The Chief Investigator has a staff of four investigators/detectives that help him investigate criminal offenses. These investigators investigate all misdemeanor crimes having a loss of under $1,000.00 and all those crimes having a greater loss value that the Army's Criminal Investigation Department (CID) declines to pursue.

C. THE LEC'S BUDGET.

The total Presidio budget was not available for research purposes. However, numbers were furnished for those areas that the comptroller felt directly affected the police force. As a result, the costs that should be charged to the LEC from other base support departments are estimates. I was permitted to interview employees of the other base support departments to estimate their costs of providing support to the LEC. I was not allowed to see any of the actual budget numbers for these other support divisions. This will distort the final numbers in this study, but does not invalidate the overall model.

The Presidio of Monterey received a total operating budget for FY97 of $106,697,200.00 of which $2,611,406.85 was spent by the Law Enforcement Command. This amount does not include the costs of the police vehicle fleet, or of maintaining the police station and sub-station. These costs are included in the Department of Logistics (DOL) budget, which owns the police vehicles, and the Department of Public Works (DPW) budget, which owns the buildings. The LEC's actual expenses for FY97 are listed in Table 2.1.

The civilian relocation allowance was an unbudgeted cost of paying for a portion of a transferring employee's moving costs. The interest charges were also unbudgeted. These charges were paid to various venders because the LEC

Civilian relocation allowance	$288.95
Travel	$13,120.29
Utilities (Contractual leases)	$6,984.96
Contractual	$29,886.16
Interest	$24.94
Supplies\equipment	$152,406.90
Payroll	$2,409,694.65
Total	$2,611,406.85

Table 2.1. LEC's FY97 Budget

failed to pay them on time. All of the other budget items are self explanatory, except for the utilities category label which is misleading.

The utilities portion of the police force's budget is actually a rent payment to the state of California for the department's California Law Enforcement Terminal (CLET). This computer terminal allows the LEC to access the state's Department of Motor Vehicle (DMV) and police warrant/criminal history information on individuals. Thus, none of the LEC's money allocated to utilities went to pay for electricity, water, heat, any other building maintenance function.

Additionally, the LEC is reimbursed $7,500.00 from the Army Family Housing Budget each quarter to help pay the cost of patrolling the housing areas. This money is added to the LEC's supplies\equipment budget. The Leguna Seca race track also reimburses the LEC for the direct labor cost of providing traffic control support during major racing events, eight or nine weekends a year. This money is added

back into the LEC's payroll budget to pay those direct labor costs. These reimbursable costs are included in the LEC's total expenditures for the last fiscal year.

D. OTHER COSTS.

The LEC receives both direct and indirect support from other base support divisions. I have attempted to capture reasonable estimates of the costs of providing that support. In most cases, I could only identify enough measurable data to estimate the costs of the direct support the other base support divisions provided the LEC. While this will lower the total costs assigned to operate the Police Force, it does not invalidate the model.

The other base support divisions I pulled costs from are DOL, DPW, the Department of Resource Management (DRM), the Department of Contracting (DOC), the Department of Information Management (DOIM), the Civilian Personnel Office (CPO), and the Staff Judge Advocate General (SJAG).

1. The Department of Logistics.

As mentioned earlier, DOL owns the LEC's patrol fleet and pays the total costs of operating that fleet including fuel, oil, and any required maintenance. The LEC's fleet of twenty vehicles are leased. The total lease cost for fiscal year 1997 was $75,825. The total maintenance cost for those vehicles was $11,803. The total estimated fuel cost was $7,738.

2. The Department of Public Works.

The LEC uses two buildings owned by DPW. One building was built in 1903 for $28,700. Because of its age, I considered this building to be fully depreciated and did not apply any depreciation costs from this building to the LEC. The estimated annual utility cost of the building is $9,033. LEC only uses approximately 700 sq. ft. of this building, from a total of 4,745 sq. ft., as the police substation. Thus, its share of the annual utility costs is about $1,333. The estimated annual maintenance cost for the LEC's share of the building is only $450.

The other building is the police station which LEC shares with the POM's CID detachment. The total square footage of the police station is 7,746 sq. ft. with LEC's portion of the building being 6,816 sq. ft. The station building was built in the mid 1970s for $252,400. It had a new roof added in the mid 1980s which cost $68,500, and was just remodeled in FY97 to convert it into a police station for $566,000. The total cost of the police station needing to be depreciated is $886,900. Using a simple straight-line 30-year depreciation with no building residual value, the annual depreciation expense is $29,653. LEC's share of the station's annual depreciation expense is $26,013.90. LEC's share of the annual estimated utility cost for the station

is $20,624. The LEC's share of estimated annual maintenance cost for the building is $7,035.98.

3. The Department of Resource Management.

The DRM's primary cost of supporting the LEC is maintaining the LEC's financial records. This cost was estimated to be $8,999. The costs for any other service that the DRM may provide were not traceable and considered to be immaterial.

4. The Department of Contracting.

The DOC is responsible for letting all contracts. The share of this cost directly attributed to LEC was estimated by DOC to be $4,289.

5. The Department of Information Management.

DOIM provides copiers, telephone lines and telephones, video teleconferencing (VTC) services, computer support, printing services, and postage support to the LEC. The estimated cost of providing that support for FY97 was as follows:

1. Copier support - $4,680.
2. Telephone support - $10,050.
3. VTC support - $60.
4. Computer support - $26,800.
5. Printing support - $290.
6. Postage - $1400.

6. The Civilian Personnel Office.

CPO provides two major types of support to the LEC. The first is advertising job openings, and gathering names of qualified interviewees for those positions. The second is providing employee-management relations support. The estimated cost of providing the LEC hiring support for FY97 was only $1,074. The estimated cost of providing the LEC employee-management relations support was $6,607.

7. The Staff Judge Advocate.

The SJAG provides the LEC with legal opinions. Most of these opinions deal with legal rules of evidence and what type of specific charge to bring against a criminal suspect. The estimated total annual cost of providing these opinions for FY97 was $9,194.*

* The SJAG and the LEC are in a reciprocal support relationship that makes it difficult to determine who is supporting who in a given situation. For example, the SJAG prosecutor tells the police to use a specific charge against a suspect that the prosecutor feels may be easier to prove in court then another charge. Is the prosecutor supporting the police, or is he simply helping his is own prosecution effort?

III. THE LEC ACTIVITY-BASED COSTING MODEL

This chapter briefly describes the activity-based costing modeling process, and then follows with the specifics of the LEC's model.

A. ACTIVITY-BASED COSTING MODELS

The first step in building any activity-based costing model is to identify the outputs or products of an organization. Once the products have been identified, some relatively easy measure of those products must be established. In most cases, products are measured in units of product produced. (Cokins, et al., 1993)

The next step is to identify the activities that are required to produce a single unit of each product. This requires analyzing the entire organizational system and subsystems within the organization to follow the tasks required to produce products. (Cokins, et al., 1993)

After all of the activities are identified, all resources consumed for those activities are identified and measured. The total costs of resources consumed by each activity are summed to provide a total cost per activity. (Cokins, et al., 1993)

Once this is done, each activity is further analyzed to determine its cost object and cost driver.

> Cost objects are usually parts, services, ingredients, products, customers, or distribution channels. Activity cost drivers recognize the proportionate discharge of each activity cost into its cost objects. (Cokins, et al., 1993, pp 10-11)

The costs of these activities are then distributed to cost objects using cost drivers. Finally, activity cost drivers are used to trace costs from resources through activities to the organization's products. (Cokins, et al., 1993)

B. THE LEC MODEL, ASSUMPTIONS AND LIMITING FACTORS

This model assumes the reader has a basic knowledge of cost accounting.

C. PRODUCTS

The products/outputs identified for the LEC, as well as the measures for these products, are shown in the following table.

Product	Measure
Police Information	
Blotter Reports	Number of blotter reports
Background Checks/Insurance Reports	Number of requests for information
Police Patrol Services	Number of patrol hours
Investigations	Number of investigations
Physical Security Inspections	Number of physical security inspections
Crimes Prevention Education	Number of education events supported
Crime Watch Hot-line	Number of times hot-line message updated
U.S. Magistrate Court Support	Number of magistrate court cases

Table 3.1. Production measurements.

All of these measures for the LEC's outputs are easily and inexpensively measured. Unfortunately, not all of these measures are currently being recorded. The LEC is not tracking the number of requests for background checks that it receives. Additionally, SJAG does not keep historical records for the number of cases that it tries each month. Thus, only estimates were available for these two measures.

D. ACTIVITIES/PROCESSES

Each of LEC's processes requires multiple activities to produce a finished product. These processes consume resources and convert them into products. The aggregated processes for the LEC used in this model are:

1. Producing blotter reports.
2. Answering requests for police information.
3. Providing police services.
4. Police Operations.
5. Investigating.
6. Conducting physical security inspections.
7. Conducting crime prevention education.
8. Preparing/updating the crime watch hot-line.
9. Providing magistrate court support.

Diagrams of these processes were validated by the police chief and are included in Appendix A.

1. Producing blotter report

The process of producing a blotter report is comprised of the following activities in the following order:

1. An investigator or patrolman writes a report.
2. The author's supervisor reviews/edits the report.
3. The author finalizes report.
4. The report is given to PAC, which inputs the report into the police data base.
5. PAC summarizes all police reports from the previous 24 hours (or 72 hours on the Monday following a weekend) into a blotter report.
6. The Deputy Chief of Police reviews/edits the blotter report.
7. PAC finalizes the blotter report and copies report to a computer floppy disk.
8. PAC gives the disk to the chief's secretary who e-mails the blotter report to various customers.

This process is completed Monday through Friday, with one blotter report being produced for each morning during the five work days. The cost driver of this process is the number of police reports that are written during the period summarized in the blotter report.

2. Answering requests for police information

Requests for police information fall into two general categories, background checks and all other requests. The process for these two categories is generally the same, but varies slightly. The general sequence is; a request for information comes to PAC, someone researches the police data

base for the answer, and then sends the results to the requester.

a. Background checks.

Background checks are requested by various organizations to see if a specified individual has run afoul of the law at the Presidio. Most of these requests are from people requesting federal security clearances or applying for federal jobs. This process varies from other requests in that it is the ADP technician who searches the police data base, and not personnel assigned to the PAC. The reason for this is the ADP technician is the only person in the organization who can access files entered into the system before 1995. The cost driver of this sub-process is the number of requests for background checks.

b. Other requests for information

Examples of other types of information requests that the LEC receives are insurance companies requesting copies of police reports of traffic accidents, individuals or lawyers requesting copies of police reports, and investigators requesting copies of old reports that have relevance to current investigations. These requests are handled by PAC. Most requests are answered on the day received. The cost driver for this sub-process is the

number of requests for police information, not including background checks.

3. Providing police services

Police services are defined as everything that the department does to support and protect the community that is not directly involved in producing another product. This is a catch all process that includes the activities of patrolling, dispatching, traffic enforcement, community relations, the activities of patrol supervisors, animal control (dog catcher), maintenance of the patrol fleet, and other miscellaneous activities. The basic activities consist of:

1. Officers preparing for patrol.
2. Patrolling.
3. Public calling police for assistance.
4. Dispatcher giving officers information.
5. Officer responding.

This basic flow obviously does not include many of the activities mentioned above. This is because these other activities can occur at any point, and in some cases at multiple points, in the process. These variations in the activity flow do not matter because the process captures the total resources consumed providing police services. The

cost driver for this process is the number of hours officers spend on patrol.

4. Police Operations

This process is an intermediate one. Police operations is defined as all of the activities of the uniformed police officers, dispatchers, animal control specialist, and maintenance technician. Costs that are traced to police operations, but can not be directly traced to producing blotter reports, providing police services, conducting crime prevention education, or providing magistrate court support are pooled here. These costs are then traced to producing police services, conducting crime prevention education, investigations, and providing magistrate court support using the work effort percentage of the patrolmen. For example, in the aggregate, the patrolmen produced police services 90.39 percent of the time. Thus, 90.39 percent of the cost of police operations was traced to producing patrol services.

5. Investigating

Investigating is defined as those activities conducted to attempt to solve a crime. This includes the activities of the department's investigators and detectives, as well as the initial investigations conducted by patrol officers. The cost driver used in the model for this process is the number of investigations conducted.

Arguments can be made that underlying or "real" investigating cost drivers should be the size and socio-economic type of the population the LEC serves. For example, a larger population is more likely to have a higher absolute number of crimes then a smaller one, even if the crime rates between the two populations are the same.

6. Physical security inspections

The physical security inspections are required by Army regulation. Each tenant organization must be inspected every eighteen months to ensure that they are in compliance with regulations. In addition, units can request a physical security inspection if they feel that they are not meeting the standard and wish to identify potential physical security problems in their areas. The LEC's physical security inspection process involves three people, the physical security inspector, the police chief's secretary, and the police chief. The process is as follows:

1. The physical security inspector inspects an organization.
2. The inspector writes a report summarizing results.
3. The police chief's secretary types the report.
4. The police chief reviews/edits the report.
5. The secretary types the final report.
6. The inspector makes a copy of the report and sends it to the inspected unit.
7. Ninety days later the inspector re-inspects to ensure all deficiencies have been corrected.

The cost driver for this process is the number of inspections conducted, both requested and required.

7. Crime prevention education

Crime prevention education is those activities such as setting up information booths at community events or visiting grade schools, which raise the public's crime prevention awareness. The LEC conducts about two of these events a month. The cost driver for this process is the number of crime prevention education events supported.

8. Crime watch hot-line

The Crime Watch Hot-line is updated bi-weekly and lists the crimes that happened on the Presidio over the previous two week period as well as giving crime prevention tips on how to stop/avoid various crimes. The process of producing this product involves only two people, the physical security inspector and the deputy chief of police, and consumes the fewest resources of all of LEC's processes. The process is as follows:

1. The inspector reviews the blotter reports for the last two weeks to determine what should be included in the recorded hot-line message.
2. He then pulls and reads the police reports of those incidents he thinks are significant.
3. He writes a script that includes tips on how to prevent the types of crimes that are summarized on the hot-line.
4. Finally, the deputy chief of police records the script.

The cost driver for this process is the number of bi-weekly police reports.

9. Magistrate court support

After the Crime Watch Hot-line, supporting the U.S. Magistrate court consumes the next fewest resources. The LEC sends one police officer to act as a bailiff for the court, and one administrative specialist to collect any fines imposed. Additionally, the LEC provides officers to testify in court as needed. During FY97, court was held approximately 24 times. The cost driver for this activity is the number of cases tried.

E. RESOURCES

The LEC uses resources that can be grouped into two broad categories. The first resource category is the set of labor, services, and materials supplied to the LEC by the other base support divisions. The total estimated cost per support division for FY97, along with descriptions of the support provided to the LEC, is discussed in Chapter II - Section D. - OTHER SERVICES. The second resource category is the set of labor, services, and materials the LEC consumed internally. The total internal costs for the LEC for FY97 are listed in Table 2.1, LEC's FY97 Budget.

Both of these resource categories include direct, indirect, and overhead costs. A difficulty in establishing

any activity-based costing model is finding accurate cost drivers for the indirect and overhead costs. Without a doubt, some of the cost drivers used to trace resource consumption in this model could be better. But finding and accurately measuring these better cost drivers would be costly. The benefit of capturing these better measures may not be worth the extra effort and cost.

The rest of this section describes the cost driver for each resource used and the problems associated with those drivers. I begin with the costs traced from the other support activities to the LEC and follow with the LEC's internal resource flow.

1. Resources supplied by the other support divisions

A summery of the resources supplied by the other base support divisions, along with the associated cost driver, is given in the Table 3.2.

a. DPW's costs drivers

This model uses square feet of building occupancy as the cost driver for all of the costs associated with building use. The size of the floor space given to a LEC department determined the amount of building costs traced to that department. While this measure may accurately reflect the consumption of building and building maintenance costs, it does not truly represent how utilities are consumed.

Supporting Department	Cost Category	Cost Driver	Cost of Support	Driver Amount	Cost/Driver
DPW	Bldg. Depreciation	Square feet of building usage	$26,014	7,516	$3.46
	Utilities	Square feet of building usage	$22,406	7,516	$2.98
	Bldg. Maint.	Square feet of building usage	$7,486	7,516	$1.00
DOL	Vehicle Leases	Number of vehicles	$75,825	20	$3,791.24
	Vehicle Maint.	Number of vehicles	$11,803	20	$590.17
	Fuel	Miles driven	$7,738	241,818	$0.03
DRM	Budget Support	Number of inquires	$8,999	208	$43.26
CPO	Hiring Support	Number of employees hired	$1,074	6	$179.08
	Labor Relations	Number of management/labor issues	$6,607	9	$734.09
DOC	Contracting Support	Number of contracts	$4,289	19	$225.73
JAG	Legal Advice	Number of requests for advice	$9,194	1095	$8.40
DOIM	Copier Support	Number of copiers	$4,680	3	$1,560.00
	Telephone Support	Number of telephone lines	$10,051	28	$358.99
	Postage	Number of items mailed	$1,400	10	$140.00
	Printing	Number of items printed	$287	50	$5.75
	Computer Support	Number of computers	$26,800	25	$1,072.00
	Video teleconferencing	Number of teleconferences	$60	1	$60.00

Table 3.2. External costs

Electricity is consumed based on the number of appliances drawing power in a given space and not on the total square footage of that space. In the LEC's case, the dispatchers working space is relatively small compared to that occupied by police operations. Yet, the dispatcher's space is crammed full of electronic gear used to communicate with patrols and monitor alarms, video monitors, and computer terminals, while the area used by police operations is mostly open space. Given the varying amounts of equipment in the two areas, the dispatching department is likely to use more electricity than police operations, and therefore, should be charged a higher cost for utilities than police operations. However, using square footage as

the cost driver creates the opposite effect, police operations is charged more for utilities than dispatching. Installing electric meters in each or estimating electric use by room would generate more accurate data. However, it is not clear that the value of the more accurate data would justify the additional cost.

Additionally, an argument can be made that the costs of sewage and water consumed are driven by the amount of employees per department and not on the square footage of working space assigned to a department. In most cases however, the more employees working in a department, the larger the work space. Thus, using the less accurate square footage cost driver does provide an approximation of actual utility use and simplifies the model by consolidating all utilities under one cost driver.

b. DOL's cost drivers

This model uses the number of vehicles assigned to a department as the cost driver for consuming vehicle leases and maintenance, and miles driven as the cost driver for consuming fuel. While on the surface these seem to be accurate cost drivers, the cost driver for maintenance could be better.

The problem lies in that not all vehicles in the police fleet are used the same way. The marked patrol vehicles are driven about 75 miles/day. The unmarked cars

assigned to investigations, on the other hand, may sit idle for days before being used. It is likely that more of the maintenance effort will be consumed by those vehicles that are driven more often.

Unfortunately, the civilian contractor who maintains the police fleet only tracks aggregated annual maintenance costs. To find the maintenance cost traced to each individual vehicle would entail manually searching the maintenance files. Because the costs involved are not material (total vehicle maintenance cost is less than one half of a percent of the LEC's total cost), the time invested in such a search would not be worth the benefit of the additional information gained.

c. DRM's cost drivers

The cost driver for DRM was difficult to identify. After interviewing the LEC's budget analyst, It was determined that the most representative cost driver comprised the number of questions and/or issues that a department contacted her to help resolve.

d. CPO's cost drivers

This model uses two cost drivers to trace LEC's consumption of CPO support. The first is the number of personnel hired, which is used to trace the cost of CPO's hiring support. Tracing costs to LEC departments based on

their number of hires reflects their share of hiring support.

The second is the number of management/labor issues generated by a LEC division, which is used to trace the cost of CPO's labor relations support. The second cost driver has the inadequacy that not all management/labor issues take the same amount of effort or time to resolve. Unfortunately, CPO does not track the amount of time spent resolving each issue. It may have been possible to establish a reasonable estimate of the time spent on each issue by interviewing the labor relations specialist on a case by case basis. But the cost of gathering the data would have exceeded the benefit gained from the more accurate information as the total CPO cost is only 0.27 percent of the total cost of the LEC, and therefore not material. Thus, the model does not use the more accurate cost driver of time spent on each management/labor issue.

e. DOC's cost drivers

The cost driver used in the model to trace DOC's cost is the number of contracts placed by DOC. This cost driver has the same problem as CPO's labor relations cost driver. Namely, not all actions are the same or require the same effort, and DOC does not track time spent on each contract. A better cost driver would be to use the time DOC spends per contract. Again, the DOC does not track the

amount of time spent resolving each contract so this was not used as a cost driver.

f. SJAG's cost drivers

The cost driver this model uses to trace the consumption of SJAG support is the number of requests for legal advice from SJAG. The number of requests for legal advice was estimated by the SJAG as three per day, for a total of 1095 requests for the year. Determining which LEC departments consumed this resource was relatively easy since only police operations and investigations request legal advice. However, determining the amount of requests for each department was more difficult. After interviewing the SJAG, the Police Chief, the Deputy Police Chief, and the Chief Investigator, I estimated police operations consumed 40 percent of SJAG's costs and investigations consumed 60 percent. While this is a relatively unsophisticated estimate, it is not likely to be materially incorrect.

g. DOIM's cost drivers

DOIM provides six types of support to LEC, each of these has its own cost driver. These cost drivers are: number of copiers for copier support, number of telephone lines for telephone support, number of computers for computer support, the number of video teleconferences for video teleconference support, the number of pieces mailed

for postage support, and the number of items printed for printing support. All of these cost drivers appear to accurately trace the consumption of DOIM resources.

2. Internal resources consumed by the LEC

Internal resources consumed are combinations of labor, supplies, and activities supplied by LEC departments used by other activities or to produce final products. This model defines LEC departments as groups of people doing the same work, and does not exactly mirror the LEC's organization chart. For example, the police chief's secretary is defined as a department because the work she does is unique. A summary of the LEC's departments, their resource cost categories, and cost drivers is given in Table 3.3.

The most common problem with the cost drivers given in Table 3.3 is the LEC simply does not measure many of them. In cases where the LEC did not capture the cost driver measure, the measure was estimated by a combination of interviewing the people conducting the work and by observing the work in process.

a. Police Chief's resources provided and cost drivers

The chief provides two general types of resource activities that are consumed by other LEC departments. The first category type is general and administrative (G&A) type of duties that benefit the entire LEC. These duties include

Department	Resource cost category	Cost Driver
Chief	General & admin. duties (G&A) Physical security inspections	Percentage of time spent on each issue Number of inspections
Chief's Secretary	Support Chief Typing support to other departments Payroll/personnel support Department e-mail	Number of hours in support Number of things typed Number of employees Number of e-mail transactions
ADP	Computer troubleshooting repair/training/support Research background checks Liaison w/DOIM for phone support	Number of computers Number of requests for checks Number of phone lines
Phy. Security	Physical security inspections Crime prevention education Crime watch phone line	Number of inspections requested & required Number of events Number of crime reports bi-weekly
Supply/Budget	Equipment/supplies/contracts purchased	Amount spent/bought/used per department
Investigations	Investigate cases Write reports Track police statistics support CID Crime prevention education	Number of cases Number of reports/cases Number of reports Number of CID agents Number of events
Deputy Chief	G&A (police operations) Physical security inspections Crime watch phone line Supervise police police operations Review police reports	Percentage of time spent on each issue Number of inspections requested & required Number of blotters bi-weekly Number of crises Number of reports/day
Training Officer	Coordinate/track/run training Supervise PAC G&A	Number of training events number of employees Number of special projects
PAC	Input data into police database Retrieve data from police database Mag. court support	Number of reports Number of requests for information Number of cases tried
Maintenance	Coordinate maintenance	Number of vehicles
Shift Supervisors	Supervise police operations	Number of patrol shifts
Station Commanders	Supervise police operations Review/correct reports	number of police stations Number of reports
Patrolmen	Patrol Conduct initial investigations Write reports Mag. court support Crime prevention education	Hours on patrol Number of calls requiring investigation Number of reports Number of cases Number of events supported
Dispatchers	Dispatch officers	hours in a day
Animal Control	Patrol	Number of animal related calls

Table 3.3. Internal resources and cost driver

such activities as functioning as the liaison with people outside of the LEC, setting general policy, and attending meetings.

The chief spends the majority of his time, about 94 percent, performing G&A types of duties. The second resource activity he provides is reviewing/editing all of the physical security inspection reports written by the physical security specialist. The chief spends about 30 minutes a week, or approximately 1.25 percent of his time, reviewing physical security inspection reports.

b. Police Chief's secretary's resources provided and cost drivers

The police chief's secretary provides four general types of resource activities that are consumed by other LEC departments. The first resource includes all of those activities/services that directly support the police chief. The second resource that the secretary provides is typing support to other departments. Third, the secretary supports all of the other LEC employees by doing all of the payroll and personnel issues paperwork. Finally, the secretary's computer is the only one connected to the Presidio's LAN. Thus, she sends and receives all official e-mail.

The percentage of time that the secretary spends providing each of these services was estimated by

interviewing the secretary and by observing her work. The resulting distribution of her work effort is as follows:

1. Supporting the chief 61 percent of the time.
2. Payroll/personnel support six percent of the time.
3. Sending & receiving e-mail nine percent of the time.
4. Typing support for police operations, physical security, supply, and PAC equally distributed with each taking up six percent of her time (total typing support took up 24 percent of her time).

The cost drivers for the services that the chief's secretary provides are listed in Table 3.3. While each of these cost drivers accurately traces resources consumed, the only one that is measured by the LEC is the number of employees assigned. The rest of the cost drivers are estimated based on interviews with the secretary.

c. ADP's resources provided and cost drivers

The ADP technician provides three general types of resource activities that are consumed by the other LEC departments. The first is computer support, which includes troubleshooting, repair, training, and other computer support. The second is researching the police data base for background checks. Third, the ADP technician is the LEC's liaison with DOIM and responsible for doing all the work orders to get telephone lines repaired.

The percentage of time that the ADP technician spends providing each of these services was estimated by

interviewing the ADP technician and by observing him work. The resulting distribution of his work effort is as follows:

1. Computer support 86 percent of the time.
2. Conducting background checks nine percent of the time.
3. Providing liaison with DOIM for phone support five percent of the time.

The ADP department's cost drivers accurately trace resources consumed and are measurable. However, the ADP technician does not track the number of requests for background checks he receives. The ADP technician estimated this number to be about 45 requests per week based on his experience and the number of recent requests he had processed.

d. Physical Security's resources provided and cost drivers

The Physical Security department provides three general types of resource activities all of which are consumed to provide final products. The first, conducting physical security inspections is made up of all of those activities required to produce the finished product for the physical security report. The second resource activity that the physical security department provides is crime prevention education. The last the resource activity supplied is updating the crime watch hot-line.

The percentage of time that the physical security inspector spends providing each of these services was estimated by interviewing the inspector and by observing him work. The resulting distribution of his work effort is as follows:

1. Physical security inspections 80 percent of the time.
2. Crime prevention education 16.5 percent of the time.
3. Updating the crime watch hot-line 3.5 percent of the time.

e. Supply's resources provided and cost drivers

Supply provides all of the equipment and supplies that are consumed by the other LEC departments. The total cost of the supply function was traced to the other LEC departments by a two step method. The first step was to trace as much of the cost of supplies/equipment/services consumed as possible directly to the department that consumed them. For example, if a department consumed 25 percent of the total supplies, equipment, and/or services the supply department purchased during the fiscal year, 25 percent of the total cost of the supply function was traced to that department. Directly tracing costs this way still left over 52 percent of supply's cost needing to be identified with specific users.

The second step was to allocate the remaining supply costs to departments based on the number of employees

in the departments. For example, the police chief, being a department of one employee, was allocated 1/52nd of the remaining supply costs. The two people working in supply are not counted in the allocation basis used to allocate supply costs to the other LEC departments. This is so that all of the supply costs are distributed to the other departments.

f. Investigations' resources provided and cost drivers

Investigations provides five general types of resource activities that are consumed by various processes. These activities are defined as follows:

(1) Investigate cases. This activity is defined as all those activities conducted to attempt to solve a crime.

(2) Write reports. This activity is defined as writing, editing, and producing a final report.

(3) Track police statistics. The investigations department is responsible for tracking each call to which a police officer responds. The data base investigations maintains to track the police effort includes such information as the type of call (i.e., domestic disturbance or larceny) the length of time the officer spent resolving the call, and the time of day the call occurred.

(4) Support CID. The investigations department shares its secretary with the Presidio's CID detachment which pays part of her salary. The part of the secretary's salary paid by CID is not included in the model.

(5) Crime prevention education. Occasionally, one of the investigators will help the physical security specialist during a crime prevention education event.

All of the cost drivers associated with the above resource activities appear to accurately trace resource consumption and are measurable. The amount of time and work effort that the investigations department puts into each of these activities was estimated by interviewing four of the six employees, and observing them work.

g. Deputy Police Chief's resources provided and cost drivers

The Deputy Police Chief provides five general types of resource activities that are consumed by various processes. The first, and most difficult to trace via a cost driver, is the amount of time he spends on general and administrative (G&A) types of activities. Like the police chief, the deputy chief spends much of his time, about 42 percent, acting as a liaison with outside organizations and the community. Unlike the chief however, the deputy chief's G&A activities are focused on specifically supporting police

operations and not the LEC as a whole. As a result, the amount of effort the deputy chief used to accomplish G&A types of tasks was all traced to the cost of providing police services.

The second resource activity that the deputy chief provides is conducting critical physical security inspections when the physical security specialist is unavailable. Usually, the deputy chief only performs physical security inspections when the physical security specialist is on leave or at his annual two weeks of Army Reserve training. Additionally, the deputy chief only inspects those units that must be inspected immediately in order to stay within the time limits set by army regulation or some other special circumstance. The deputy chief estimated that he only spent 21 hours a year doing this activity. This works out to be approximately one percent of his annual work effort.

The third resource activity that the deputy chief provides is reading the script for the crime watch hot-line. The percentage of the deputy chief's work effort traced to this activity is estimated to be less than one percent. This small number is still significant as it is about 15 percent of the total cost of the hot-line.

The fourth resource activity that the deputy chief provides is supervising police operations. The deputy chief

spends approximately half of his time supervising police operations. This activity includes such subactivities as dealing with operational crises, resolving personnel issues, going on patrol, and observing police operations.

The fifth resource activity that the deputy chief provides is reviewing the blotter report, and all police reports summarized in that blotter, for correctness and content. The percentage of the deputy chief's work effort traced to this activity is estimated to be close to 6 percent.

Of the cost drivers used to trace the consumption of the resource activities provided by the deputy chief, neither the cost driver for G&A nor for supervising police operations is measured nor tracked. This is understandable because of the effort and associated cost involved with measuring these cost drivers. To track the daily effort comprised of the hundreds of administrative tasks required to supervise a police force would be time consuming, and probably not worth the costs involved. The amount of time and work effort that the deputy chief put into each of these activities was estimated by interviewing him, and observing him work.

h. Training officer's resources provided and cost drivers

The Training officer provides three general types of resources that are consumed by the other LEC departments. Not surprisingly, the primary resource activity the training officer provides is coordinating, planning, tracking, and conducting training for the LEC employees. The training the training officer coordinates includes police specific, investigations specific, administrative specific, and general federal employee types of training. The model traces these costs directly to the LEC departments which consumed the training.

The next most important resource activity that the training officer provides is supervising PAC. The training officer is responsible for reviewing the blotter reports PAC generates, resolving any PAC personnel issues, and giving PAC personnel their annual performance evaluation.

The final resource activity that the training officer provides is that of completing special projects for the police chief. These special projects fall into the G&A cost category because they normally benefit the entire organization. These projects run the gamut from ordering police badges, to conducting urinalysis tests on LEC personnel, to representing the LEC at various Monterey County law enforcement organization meetings. Each of these special projects has a group of costs that could be traced

directly to individual LEC departments. However, given the number of projects and the amount of personnel who benefited from those projects, it was not cost effective to directly trace these costs. As a result, the model allocates the costs of special projects to the other departments based on the number of employees in each department.

The percentage of time that the training officer spends providing each of these services was estimated by interviewing the training officer and by observing him work. The resulting distribution of his work effort was as follows:

1. Coordinating training 75 percent of the time.
2. Supervising PAC 15 percent of the time.
3. Doing special projects 10 percent of the time.

The training officer does not track the number of special projects he is assigned. Nor does he track the time he spends performing these projects or who the projects benefit most. Thus, the cost driver for conducting these special projects is estimated based on interviews with the training officer.

i. PAC's resources provided and cost drivers

PAC provides three general types of resource activities all of which are consumed by products. These activities are entering data into the police database,

retrieving data from that database, and providing administrative support to the U.S. Magistrate Court.

The percentage of time PAC spends providing each of these services was estimated by observing PAC work and from analyzing three months of PAC's weekly performance logs. The resulting distribution of PAC's work effort was as follows:

1. Inputting data 86 percent of the time.
2. Retrieving data from the database 11 percent of the time.
3. Providing administrative support the U.S. Magistrate Court 3 percent of the time.

The cost drivers that trace the costs of PAC inputting and retrieving data accurately trace resources to those activities which consumed them. PAC maintains a weekly record of the number of reports that they enter into the police database and the number of requests for police information that they receive. However, the cost driver that this model uses to trace the consumption of magistrate support is an estimate. The SJAG keeps a file on each individual case it takes to court. However, the SJAG does not keep a running total of how many cases it took to trial. To find this data, someone would have to go into the case files and count the cases. This would probably take one person a full day to pull and count the cases. Because of privacy act considerations, the SJAG would have had to

provide the personnel to count the cases. Given SJAG's limited personnel resources, the model used SJAG's estimate of the average number of cases tried each month.

j. Maintenance's resources provided and cost drivers

Maintenance provides one general type of resource activity that is consumed by the other LEC departments. The maintenance clerk provides all the coordination required to the maintain the LEC's vehicles. The cost driver for maintenance is the number of vehicles assigned to each LEC department.

This cost driver could be improved. As explained earlier when discussing DOL's cost drivers, the problem with using the number of vehicles assigned as the cost driver is that not all vehicles are used the same way. The vehicles that are driven more are more likely to have a higher maintenance cost. As also mentioned earlier, for the purpose of this thesis, the cost of obtaining more accurate data (i.e., the maintenance cost of each vehicle) exceeded the benefit of having that data.

k. Shift supervisors' resources provided and cost drivers

The Shift supervisors provide one general type of resource activity, supervising police operations, that is consumed by patrol operations. One shift supervisor is on

duty with each 12 hour shift. They are directly responsible for the conduct of that shift. The entire work effort of shift supervisors is traced to providing police services.

l. Station commanders' resources provided and cost drivers

The Station commanders provide two general types of resource activities that are consumed by other LEC departments. These activities are supervising police operations and reviewing/correcting police reports. Like shift supervisors, one station commander is on duty each 12 hour shift. Station commanders are subordinate to shift commanders and are responsible for the operation of the police station. In addition to being the direct supervisor of the police out on patrol, the station commander is also the initial reviewer of police reports.

The percentage of time the station commanders spend providing each of these services was estimated by interviewing half of them and by observing them work. The resulting distribution of their work effort was supervising police operations 90 percent of the time, and reviewing/editing police reports 10 percent of the time.

m. Patrolmen's resources provided and cost drivers

The Patrolmen provide five general types of resource activities that are consumed by processes to

produce products. The first, and most important, resource activity patrolmen provide is conducting patrols. This activity makes up the majority of the product of police services. The second resource activity patrolmen provide is conducting initial investigations. When a call comes into the station a patrol officer conducts the initial investigation to determine if indeed a crime was committed. If a crime was committed the patrol officer turns the case over to investigations to investigate further. The third resource activity that patrolmen provide is writing police reports. As mentioned earlier, these reports are then given to PAC to be entered into the police database and added to a blotter report. The fourth resource activity the patrolmen provide is U.S. Magistrate Court support. Police operations provides one patrolman to serve as a bailiff and patrolmen to testify as needed. The final resource activity that the patrolmen provide is crime prevention education. Occasionally, one or two patrolmen will help the physical security specialist at a crime prevention education event.

The percentage of time patrolmen spend providing each of these services was estimated from interviews, observing them work, and analyzing every patrol log for the month of July 1997. According to the patrol logs, the total work time for patrolmen in the month of July was 2813.5 hours. Their distribution of work was as follows:

1. Patrolling used 2543.27 hours, or 90.39 percent of the time.

2. Conducting initial investigations used 77.23 hours, or 2.75 percent of the time.

3. Writing police reports used 180.5 hours, or 6.42 percent of the time.

4. Providing U.S. Magistrate Court support used 12 hours, or 0.43 percent of the time.

5. Providing crime prevention education used 28 minutes, or 0.02 percent of the time.

While some of these percentages are quite small, and may seem to be immaterial, the associated costs are material when compared to the total costs of the LEC's products produced. For example, while supporting the magistrate court is only estimated to be 0.43 percent of the total of the patrolmen's work effort, the cost of this resource activity is over 50 percent of the total cost of LEC's product, U.S. Magistrate Court support.

n. Dispatch's resources provided and cost drivers

Dispatch provides one general type of resource activity that is consumed by patrol operations. A dispatcher must be on duty 24 hours a day to provide police operations with dispatch support. Dispatch acts as the central communications hub for police operations, and provides patrols with access to CLET information.

The model uses a cost driver of number of hours per day to trace dispatch's costs because one dispatcher is

on duty 24 hours a day. The number of uniformed officers in the LEC is small enough that even if the entire police force was deployed at one time, only one dispatcher would be needed.

o. Animal control's resources provided and cost drivers

Animal control provides one general type of resource activity that is consumed by patrol operations. LEC's one animal control specialist is responsible for controlling the animal populations, both wild and domesticated, on the POM and POM annex. The majority of his work load is capturing stray domestic animals and wild animals. When the animal control specialist is not on duty, patrol operations takes over his duties.

F. COST FLOWS

The cost flows of this model start with the costs of external resources supplied to the LEC. The model traces those costs via cost drivers to the various LEC departments or processes which consume them. The model next uses cost drivers to trace the percentages of internal resources consumed to the LEC departments and processes which consumed them. Because most of the LEC departments have reciprocal support arrangements , i.e., part of the police chief's secretary's work supports the supply department, and part of supply's work supports the secretary, all of the costs from

all of the LEC departments are simultaneous allocated to all the other LEC departments and processes using matrix algebra*. Finally, the model traces the costs of total resources consumed by the processes to the cost of the products themselves. Appendix B contains accounting spreadsheets showing the cost matrices.

For example, the total cost of investigations was arrived at by first tracing external costs directly to the investigations process. In this case, about 60 percent, or $5,516.15, of the resources provided by the SJAG were directly traced to the investigations process. At the same time, the rest of the external costs where traced directly to the LEC departments and other processes which consumed them.

Next, the LEC's total direct costs from the LEC's FY97 budget (Table 2.1), were distributed to the LEC departments. In this example, the investigations department's total payroll cost for FY97 of $317,655 was the department's only budgeted direct cost, and none of the costs in this step were directly traced to the investigations process.

The next step was to trace all the costs of all the LEC departments to the other departments and processes which

* The reciprocal method of service department cost allocation recognizes all services provided by any department. With the reciprocal method, the costs of each department and process are written in equation form: Total cost = Direct cost + Costs allocated from other departments. The system of equations is then solved simultaneouly using matrix algebra. By solving the equations simultaneously, we account for all interdepartment allocations. (Maher, et al., pp 202-203)

consumed them. The total cost traced to the investigations department is the equation:

Investigations department Cost =
$364,223.85 +
11.18 percent of the chief's total costs +
0.7 percent of the chief's secretary's total cost +
23.54 percent of ADP's total cost +
9.07 percent of supply's total cost +
1.13 percent of training's total cost +
20 percent of maintenance's total cost
(see Appendix B).

At the same time, 100 percent of the investigations department's costs were allocated to the other LEC departments and processes which consumed the investigation departments services.

The investigations process cost equation is:

Investigations process cost =
59.79 percent of the investigations department's cost +
7.52 percent of training's total cost +
2.75 percent of the patrolmen department's cost.

Once all the costs of all the LEC departments were traced to other departments and processes, the model used matrix algebra to simultaneously solve all equations.

The next step was to allocate the final police operations process costs to the other processes. Using the aggregated patrolmen's percentages of work effort to trace these costs, 2.75 percent were traced to the investigations process. Summing up all these costs amounted to $319,063.26, or 11.19 percent of LEC's total cost was consumed to produce investigations.

The very last step in the model was to divide the investigation process's total cost by the total number of investigations conducted in FY97 to get the cost per investigation. The LEC conducted 975 investigations in FY97, so the cost per investigation was $327.24.

IV. CONCLUSION AND RECOMMENDATIONS

The total estimated FY97 cost of running the LEC was about $2,850,140. The model did not discover any surprising hidden costs. Personnel costs are by far the most expensive resource consumed by the LEC. A little more than 85 percent, or $2,633,935, of the LEC's total cost is payroll. The costs of resources provided by POM's other base support departments amounted to less than 8 percent of the total.

This thesis demonstrated how activity-based costing models can be used by small Army organizations to establish baseline costs for all activities, processes, and products produced by these organizations. In particular, other Army installation police departments can use this model as a template, with very little or no modification, to help them determine their costs. Once cost baselines are established, and organizational processes are analyzed, an organization can more easily improve its processes to increase cost effectiveness and efficiency.

A. COSTS OF PRODUCTS

The total estimated cost of producing each product, along with the estimated cost per unit of product output, is given in the following table.

Product	Total cost	Percentage of total LEC cost	Number of outputs	Cost per output
Police Information				
Blotter Reports	$431,842.23	15.15%	260	$1,660.93
Background Checks/ Insurance Reports	$18,793.10	0.66%	3,120	$6.02
Police Patrol Services	$1,992,402.61	69.91%	30,520	$65.28
Investigations	$319,063.26	11.19%	975	$327.24
Physical Security Inspections	$59,958.41	2.10%	47	$1,275.71
Crimes Prevention Education	$12,530.64	0.44%	25	$501.23
Crime Watch Hot-line	$2,956.39	0.10%	26	$113.71
U.S. Magistrate Court Support	$12,581.94	0.44%	36	$349.50

Table 4.1. Product Costs

As estimates, the costs in Table 4.1 are not exact. Nonetheless, these total cost figures are accurate based on reasonable estimates and can be used as a baseline against which to improve. Additionally, even if the product cost totals are not exact, the relative amount of the total cost traced to each product should accurately represent reality. For example, the model traced a little less than 70 percent of the total LEC's cost to producing Police Patrol Services. While it did not cost exactly $1,992,402.61 to produce Police Patrol Services, it did consume about 70 percent of LEC's total resources.

B. LEC ISSUES, RECOMMENDATIONS

Using activity-based costing to analyze an organization has more than one benefit. The most obvious benefit is the identification of all of the hidden costs of an activity or process consumes so that those costs can be controlled. Another key benefit is that the entire organizational

process must be fully analyzed to identify all of the activities and all of the costs consumed by those activities. This introspective look at all of the organization's processes can uncover problems and inefficiencies that, otherwise, could have been left undiscovered. The remainder of this section points out two of the significant inefficiencies found in the LEC's processes, and provides recommendations as to possible remedies.

1. Issue: Station Commanders

The biggest inefficiency found in the LEC during this study is with the job position of the station commander. The station commander's position is simply not needed for the current LEC size and workload. The station commander's job is nominally to supervise patrolmen, give guidance to the dispatcher in moving patrols and assist him in answering phone calls, and helping any customer that may walk into the police station. The reality of the current situation is that the dispatchers are professional enough that they require little guidance and answer the majority of phone calls themselves. The shift supervisor manages the patrolmen. And the few walk in customers that come into the station can be greeted by PAC personnel. Nearly every duty for which the station commander is responsible is also the duty of some other employee.

The LEC's standard police shift is made up of one shift supervisor, one station commander, one dispatcher, all in the station, and between three and seven patrolmen out on patrol. Analyzing the duty logs for the month of July shows that nearly 40 percent of the work shifts had just as many personnel in the station as patrolmen out on patrol. In other words, for nearly 40 percent of the time, *every patrolman had their own individual supervisor/dispatcher* back in the station

2. Recommendation

The station commander's position should either be eliminated, or the position should be turned into a working supervisor type of position with the commander supervising while out on patrol. If the station commander's position was eliminated, the LEC would save approximately $246,100 per year. Moving the station commanders out of the station and putting them on patrol, would increase patrol coverage between 25 and 13 percent, depending on the size on the shift.

3. Issue: Typing Police Reports

Currently, the LEC, as an organization, types the same police report three times. This does not include the multiple rewrites and corrections that the writing officer may make to a report before it is accepted. The writing officer types the original report on one computer. Once the

report has been reviewed and approved by the station commander, the report is given to PAC which types a synopsis of the report into another computer, the police database. Finally, the investigations secretary types another synopsis of the report into another computer for statistical analysis.

All of these computers are in the same building, and the LEC is currently working to install a LAN linking these computers. Once the LAN is installed, and the appropriate software in place, police reports will only be typed once. After the writing patrol officer finishes a report, it will automatically be entered into the police information database and the statistical database. This will eliminate a significant portion of the work load of four people. Eighty-five percent of the work load for PAC is typing data into the database. Once the LAN is installed, there will not be enough data entry work to keep three personnel fully employed. Additionally, about 45 percent of the investigation's secretary work load should disappear once the LAN is installed.

4. Recommendation

Reduce the size of PAC by one or two employees once the LAN is installed. Eliminating one position will save LEC about $24,100 a year. Eliminating two positions will save LEC about $48,200 per year.

C. DISCUSSION

This section includes findings/issues that do not fall under any particular category.

1. A Problem with Army Service Based Costing

As stated in Chapter I, the Army uses a partial form of activity-based costing called serviced based costing to establish baseline costs of general services at the major command and installation level. For example, the Presidio's total service cost for law enforcement is the LEC's direct budget. It includes only the direct costs incurred by the LEC. This cost is then divided by some output measure to get a cost per output, similar to activity-based costing. However, no attempt is made to trace any indirect costs to the services, only direct costs are used.

The two output measures used for law enforcement under service based costing are the number of military police reports written, the primary measure, or the number of police patrol hours, the secondary measure. The problem lies with using the number of military police reports as a baseline in which to judge cost effectiveness of Army police organizations. Effective police forces prevent crime, and lower crime rates. Lower crime rates translate to fewer crimes and thus fewer police reports. Fewer police reports translates to a higher cost per report, which at first glance seems to indicate poorer cost efficiency when

compared to historic records or other, less effective, police forces. This is a poor measure. This army service based costing measure makes poor performance look good and good performance look bad. Thus it should not be used as a performance measure.

2. Potential Research and data errors

The primary method for data gathering used in this thesis was through interviews and direct observation. Two potential problems with the data are:

1. The actual work effort people believe they perform is not always what they actually do. (Bernard, 1989, pp 222-223)

2. People behave differently when being observed. (Bernard, 1989, p 150)

3. The Cost of Supporting CID

The total annual cost of the investigations' secretary who support CID came to $5,646.25. CID paid to upgrade the secretary's position from a GS-4 to a GS-5, and will continue to reimburse the Presidio for her incremental salary increase, about $2,200, into the foreseeable future as part of a support agreement. Even if the model's cost estimate for the services provided to CID has a relatively large margin or error, this cost is still an order of magnitude larger than the annual amount that CID is reimbursing the Presidio. CID should be paying more for the secretary's services.

As a note, CID's cost is not included in LEC's cost in the model. Nor did the model use the secretary's full salary to compute costs. The secretary's position was modeled using GS-4 salary data.

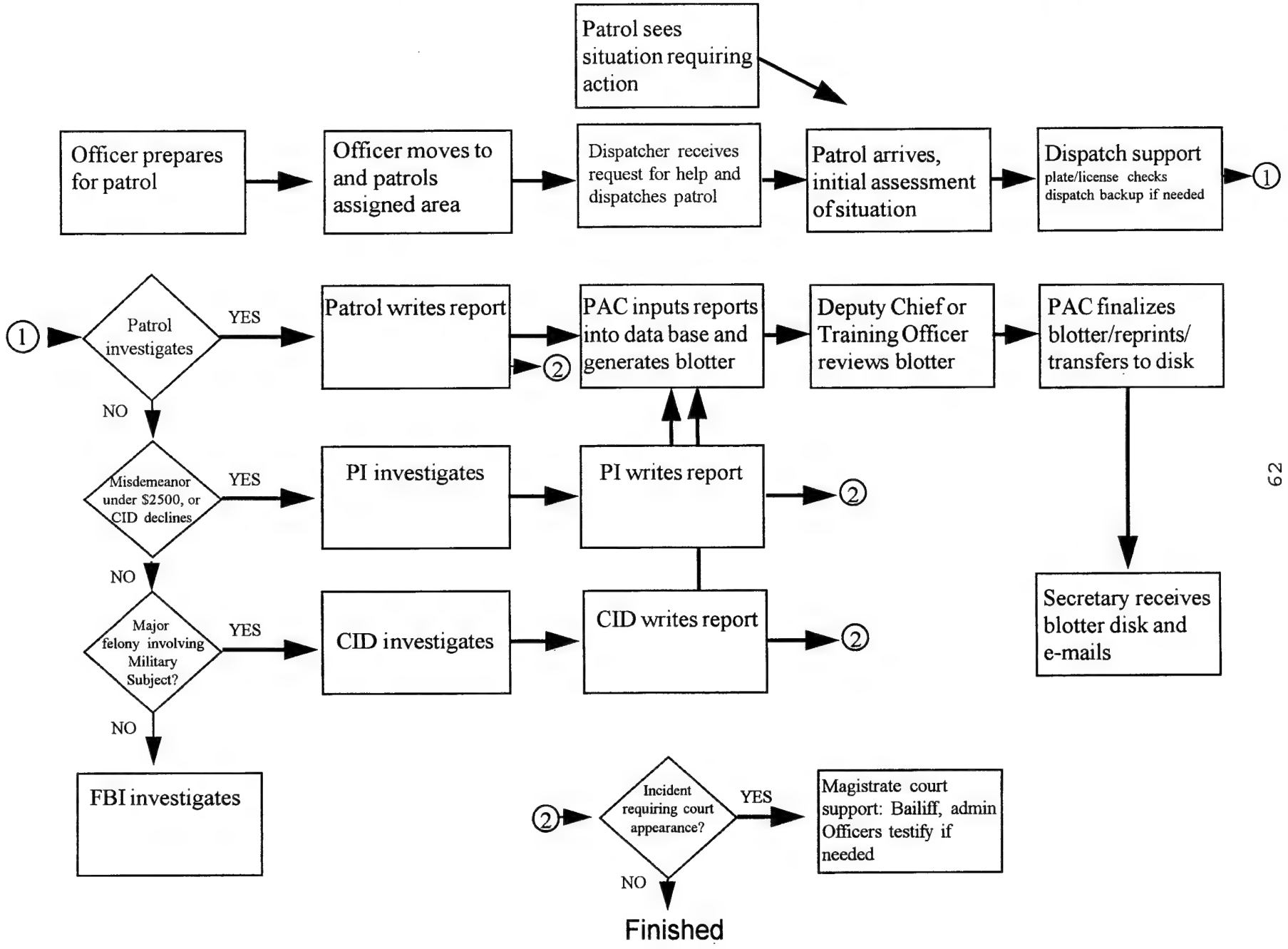
D. RECOMMENDATIONS FOR FURTHER RESEARCH

Two general types of further research should be pursued to help assess the LEC and gain a more accurate picture as to the effectiveness and efficiency of the organization. The first type involves obtaining more accurate estimates of both costs and cost drivers from the Presidio's other base support divisions. Ideally, the Presidio should do an installation wide activity-based accounting assessment so that all costs are captured as accurately as possible.

The second type of research involves capturing similar costs from other police departments, both civilian police departments surrounding the Presidio, and similar sized police departments at other Army installations. This cost data could then be used to compare the LEC's performance to those other police departments.

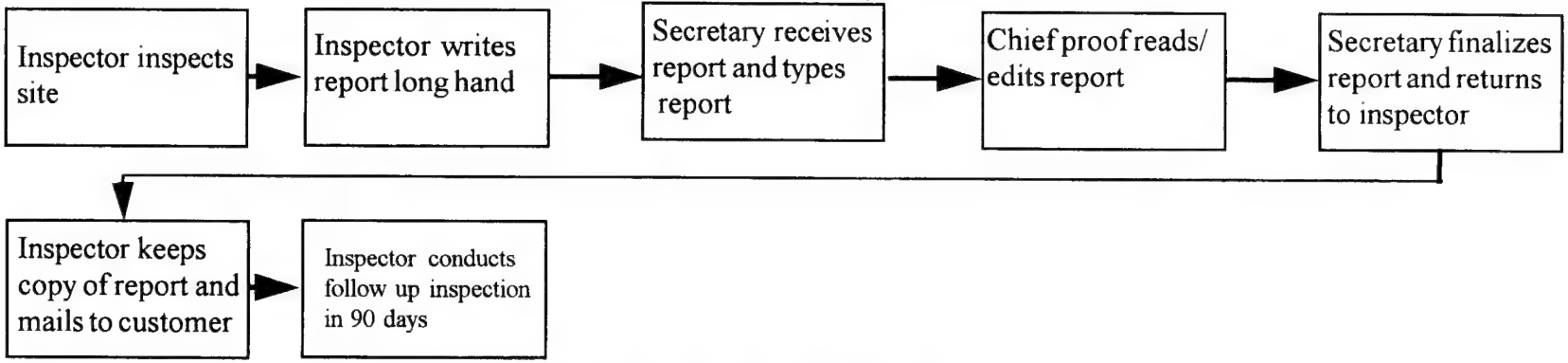
APPENDIX A. LEC PROCESS FLOW DIAGRAMS

LEC Law Enforcement Internal Process Flow

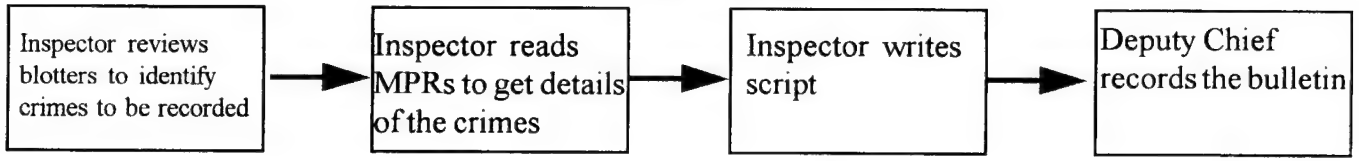


Physical Security Process Flows

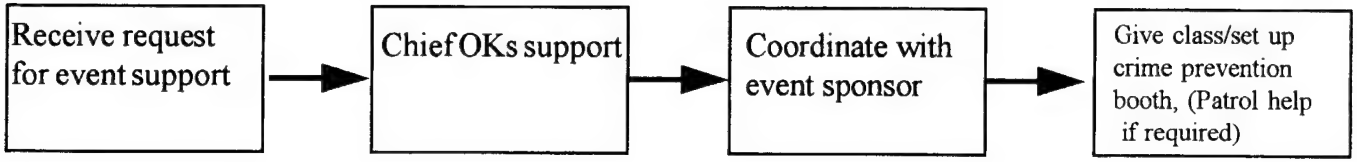
Physical Security Inspections



Crime Watch Phone Bulletins

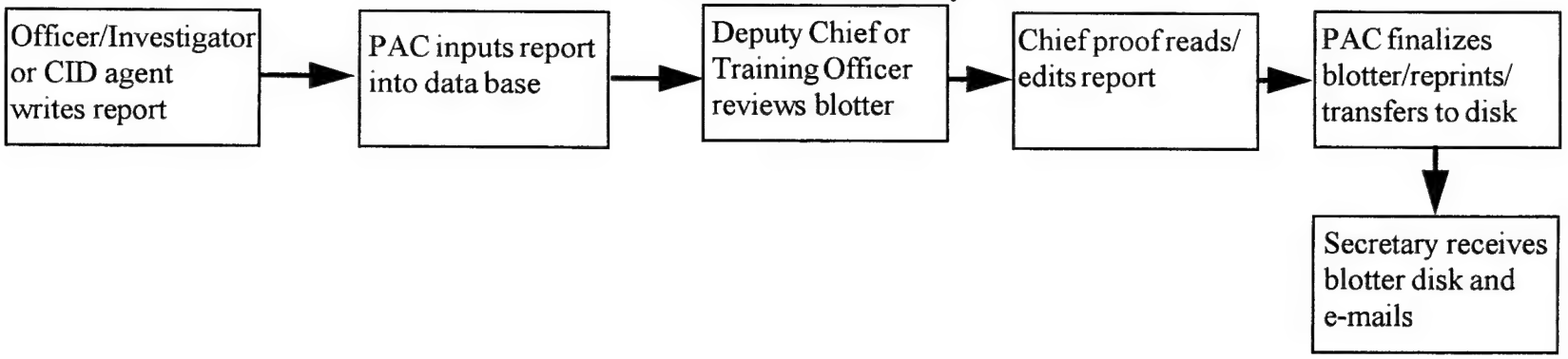


Crime Prevention Education Events

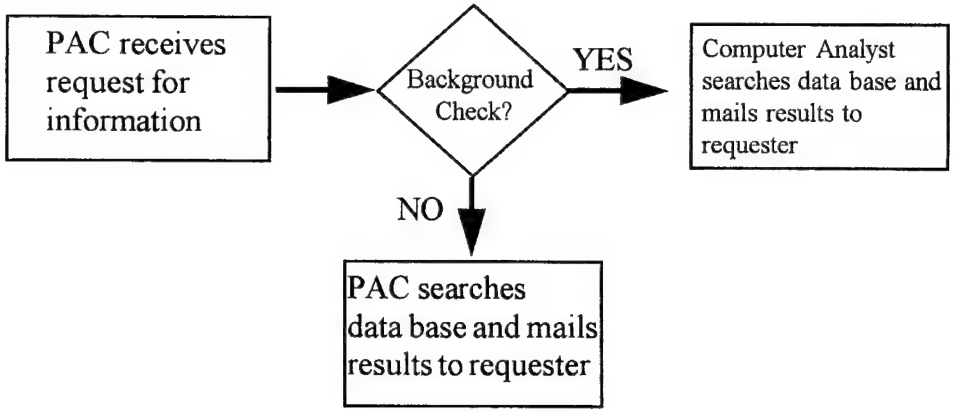


Police Information Process Flows

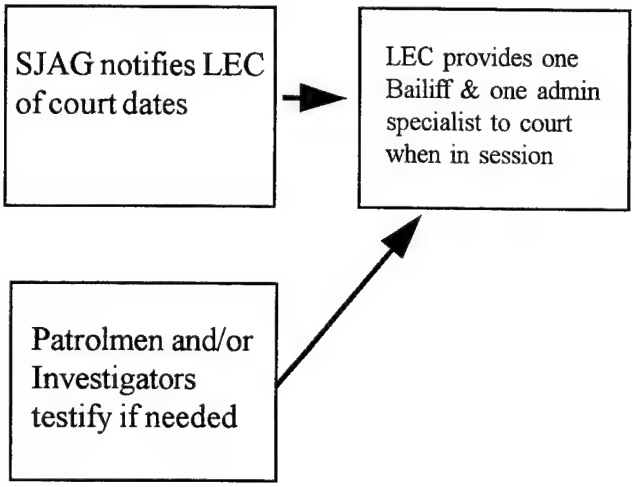
Produce Blotter Report



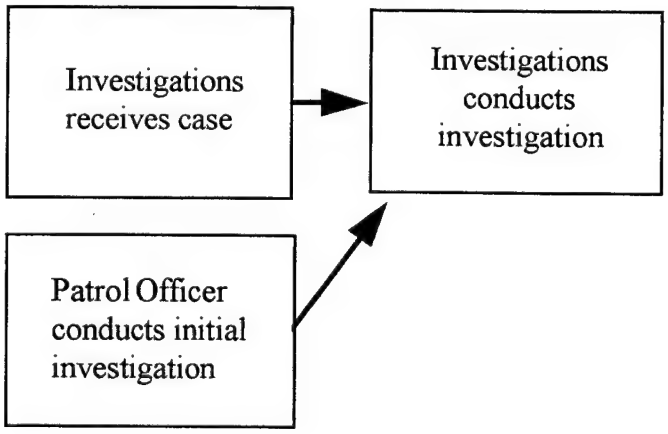
Background Checks/Insurance Accident Reports



Magistrate Court Support Process Flow



Investigations Process Flow



APPENDIX B. ACCOUNTING SPREADSHEETS

This appendix is arranged as following:

1. Pages 68 through 71 are one continuos spread sheet.
2. Pages 72 through 75 are one continuos spread sheet.
3. Pages 76 through 78 are one continuos spread sheet.
4. Pages 79 and 80 are one continuos spread sheet.

Supporting Department	Cost Category	Cost Driver	Cost of Providing Support (FY97)	Driver Amount	Cost/Driver	Chief		Chief's Secretary		ADP	
						driver	cost	driver	cost	driver	cost
DPW	Bldg Depreciation	Square feet of building usage	$26,013.90	7,516	$3.46	377.95	$1,308.12	255.84	$885.50	249.34	$863.00
	Utilities	Square feet of building usage	$22,406.34	7,516	$2.98	377.95	$1,126.71	255.84	$762.70	249.34	$743.32
	Bldg Maint	Square feet of building usage	$7,485.98	7,516	$1.00	377.95	$376.44	255.84	$254.82	249.34	$248.35
DOL	Vehicle Leases	Number of vehicles	$75,824.75	20	$3,791.24		$0.00		$0.00		$0.00
	Vehicle Maint	Number of vehicles	$11,803.37	20	$590.17		$0.00		$0.00		$0.00
	Fuel	Miles driven	$7,738.16	241,818	$0.03		$0.00		$0.00		$0.00
DRM	Budget Support	Number of inquires	$8,998.68	208	$43.26		$0.00		$0.00		$0.00
CPO	Hiring Support	Number of employees hired	$1,074.48	6	$179.08		$0.00		$0.00		$0.00
	Labor Relations	Number of management/labor issues	$6,606.77	9	$734.09		$0.00		$0.00		$0.00
DOC	Contracting Support	Number of contracts	$4,288.80	19	$225.73		$0.00		$0.00		$0.00
JAG	Legal Advice	Number of requests for advice	$9,193.58	1095	$8.40		$0.00		$0.00		$0.00
DOIM	Copier Support	Number of copiers	$4,680.00	3	$1,560.00		$0.00		$0.00		$0.00
	Telephone Support	Number of telephone lines	$10,051.72	28	$358.99	1.00	$358.99	2.00	$717.98	1.00	$358.99
	PC Support	Number of computers	$23,925.30	25	$957.01	1.00	$957.01	1.00	$957.01	2.00	$1,914.02
	Postage	Number of items mailed	$1,400.00	10	$140.00	10.00	$1,400.00				
	Printing	Number of print jobs	$287.25	50	$5.75	50.00	$287.25				
	Video Teleconferencing	Number of teleconferences	60	1	$60.00	1.00	$60.00		$0.00		$0.00
		Total external support costs ==>	$221,839.09				$5,874.52		$3,578.01		$4,127.69

	Direct costs		Driver		Chief		Chief's Secretary		ADP	
Expense	Cost object	Cost	Amount		driver	cost	driver	cost	driver	cost
Civilian relocation allowance	Physical Security	$288.95	1			$0.00		$0.00		$0.00
Travel	Training	$13,120.29	1			$0.00		$0.00		$0.00
Utilities (Contractual leases)	Dispatch	$6,984.96	1			$0.00		$0.00		$0.00
Contractual	Supply	$29,886.16	1			$0.00		$0.00		$0.00
Interest	Supply	$24.94	1			$0.00		$0.00		$0.00
Supplies\equipment	Supply	$152,406.90	1			$0.00		$0.00		$0.00
Payroll	Employee	$2,431,223.52	54		1.00	$73,880.83	1.00	$32,429.30	1.00	$48,496.12
	Total direct cost	$2,633,935.72				$73,880.83		$32,429.30		$48,496.12
	LEC's total external and direct cost	$2,855,774.81								

Phy Security		Supply/Budget		Investigations Dept		Deputy Chief		Training Officer		PAC		Maintenance		Shift Supervisors	
driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost
228.14	$789.61	598.56	$2,071.68	2,340.97	$8,102.40	325.61	$1,127.00	719.98	$2,491.94	418.65	$1,449.00	118.00	$408.42		$0.00
228.14	$680.11	598.56	$1,784.39	2,340.97	$6,978.77	325.61	$970.71	719.98	$2,146.36	418.65	$1,248.05	118.00	$351.78		$0.00
228.14	$227.22	598.56	$596.17	2,340.97	$2,331.62	325.61	$324.31	719.98	$717.10	418.65	$416.98	118.00	$117.53		$0.00
	$0.00		$0.00	4.00	$15,164.95		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00	4.00	$2,360.67		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00	33,801.73	$1,081.66		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00	208.00	$8,998.68		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00	2.00	$358.16		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00	1.00	$734.09		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00	19.00	$4,288.80		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00	1.00	$1,560.00		$0.00		$0.00	1.00	$1,560.00		$0.00		$0.00
1.00	$358.99	2.00	$717.98	6.00	$2,153.94	1.00	$358.99	1.00	$358.99	2.00	$717.98	0.50	$179.50	1.00	$358.99
1.00	$957.01	1.00	$957.01	6.00	$5,742.07	1.00	$957.01	1.00	$957.01	4.00	$3,828.05	1.00	$957.01		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$3,012.94		$19,414.70		$46,568.33		$3,738.02		$6,671.41		$9,220.05		$2,014.23		$358.99

Phy Security		Supply/Budget		Investigations Dept		Deputy Chief		Training Officer		PAC		Maintenance		Shift Supervisors	
driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost
1.00	$288.95		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00	1.00	$13,120.29		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00	1.00	$29,886.16		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00	1.00	$24.94		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00	1.00	$152,406.90		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
1.00	$58,074.28	2.00	$58,841.38	6.00	$317,655.52	1.00	$60,897.98	1.00	$48,330.87	3.00	$72,513.52	1.00	$25,131.30	5.00	$256,190.66
	$58,363.23		$241,159.38		$317,655.52		$60,897.98		$61,451.16		$72,513.52		$25,131.30		$256,190.66

Police Operations													
Station Commanders		Patrolmen		Dispatchers		Animal Control		Police Information, Blotters		Information Requests		Police Ops	
driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	Cost
	$0.00			395.05	$1,367.31	118.00	$408.42		$0.00		$0.00	1,369.93	$4,741.51
	$0.00			395.05	$1,177.70	118.00	$351.78		$0.00		$0.00	1,369.93	$4,083.96
	$0.00			395.05	$393.47	118.00	$117.53		$0.00		$0.00	1,369.93	$1,364.46
	$0.00				$0.00	1.00	$3,791.24		$0.00		$0.00	15.00	$56,868.56
	$0.00				$0.00	1.00	$590.17		$0.00		$0.00	15.00	$8,852.52
	$0.00				$0.00	4,891.68	$156.53		$0.00		$0.00	203,124.21	$6,499.97
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00	4.00	$716.32		$0.00		$0.00		$0.00		$0.00		$0.00
1.00	$734.09	6.00	$4,404.52	1.00	$734.09		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	1.00	$1,560.00
1.00	$358.99	1.00	$358.99	7.00	$2,512.93	0.50	$179.50		$0.00		$0.00		$0.00
1.00	$957.01	4.00	$3,828.05	1.00	$957.01	0.00	$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$2,050.09		$9,307.87		$7,142.50		$5,595.16		$0.00		$0.00		$83,970.99

Station Commanders		Patrolmen		Dispatchers		Animal Control		Police Information, Blotters		Information Requests		Police Ops	
driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	Cost
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00	1.00	$6,984.96		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00		$0.00
5.00	$246,081.94	22.00	$990,067.09	3.00	$109,055.42	1.00	$33,577.30		$0.00		$0.00		$0.00
	$246,081.94		$990,067.09		$116,040.38		$33,577.30		$0.00		$0.00		$0.00

Process												
Police Patrol Service		Investigations		Crime Prevention Ed		Crime Watch Hot-line		Phy Security Inspect		Magistrate Support		
driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	Totals
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$26,013.90
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$22,406.34
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$7,485.98
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$75,824.75
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$11,803.37
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$7,738.16
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$8,998.68
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$1,074.48
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$6,606.77
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$4,288.80
438.00	$3,677.43	657.00	$5,516.15		$0.00		$0.00		$0.00		$0.00	$9,193.58
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$4,680.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$10,051.72
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$23,925.30
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$1,400.00
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$287.25
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$60.00
	$3,677.43		$5,516.15		$0.00		$0.00		$0.00		$0.00	
												$221,839.09
Police Patrol Service		Investigations		Crime Prevention Ed		Crime Watch Hot-line		Phy Security Inspect		Magistrate Support		
driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	Totals
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$288.95
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$13,120.29
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$6,984.96
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$29,886.16
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$24.94
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$152,406.90
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	$2,431,223.52
	$0.00		$0.00		$0.00		$0.00		$0.00		$0.00	
												$2,633,935.72

			Total cost per	Percentage		Chief		Chief's Secretary		ADP	
Department	Activity/cost category	Cost Driver	Department	of effort		driver	cost	driver	cost	driver	cost
Chief	G&A	Percentage of time spent on each issue	$79,755.35	98.75%				1.86%	$1,486.01	1.86%	$1,486.01
	Physical security inspections	Number of inspections		1.25%							
Chief's Secretary	Support Chief	Number of hours in support	$36,007.31	61.07%		61.07%	$21,990.43				
	Typing support to other departments	Number of things typed		24.00%							
	Payroll/personnel support	Number of employees		6.15%		0.12%	$41.81			0.12%	$41.81
	Department e-mail	Number of e-mail transactions		8.77%							
ADP	Computer toubleshooting/repair/training/	Number of computers	$52,623.81	86.00%		3.74%	$1,967.67	3.74%	$1,967.67		
	Research background checks	Number of requests for checks		9.00%							
	Liaison w/DIOM for phone support	Number of phone lines		5.00%		0.19%	$97.45	0.37%	$194.90		
Phy Security	Physical security inspections	Number of inspections requested & required	$61,376.17	80.00%							
	Crime prevention education	Number of events		16.50%							
	Crime watch phone line	Number of blotters bi-weekly		3.50%							
Supply/Budget	Equipment/supplies/contracts purchased	Amount spent/bought/used per department	$260,574.09	100.00%		3.19%	$8,302.15	1.00%	$2,608.21	1.00%	$2,608.21
Investigations	Investigate cases	Number of cases	$364,223.85	59.79%							
	Write reports	Number of reports/cases		33.43%							
	Track police stats	Number of reports		5.38%							
	support CID	Number of CID agents		1.33%							
	Crime prevention education	Number of events		0.07%							
Deputy Chief	Indirect Police Operations activities	Percentage of time spent on each issue	$64,635.99	42.16%							
	Physical security inspections	Number of inspections requested & required		1.01%							
	Crime watch phone line	Number of blotters bi-weekly		0.58%							
	Supervise police ops	Number of Crises		50.00%							
	review blotters	Number of MPRs/day		6.25%							
Training Officer	Coordinate/track/run training	Number of training events	$68,122.57	75.00%							
	supervise PAC	number of employees supervised		15.00%							
	G&A	Number of special projects		10.00%		0.19%	$128.53	0.19%	$128.53	0.19%	$128.53
PAC	Input data into police database	Number of MPRs	$81,733.57	85.41%							
	retrieve data from police database	Number of requests for info		11.22%							
	Mag court support	Number of cases tried		3.37%							
Maintenance	Coordinate maintenance	Number of vehicles	$27,145.54	100.00%							
Shift Supervisors	Supervise police operations	Number of Patrol shifts	$256,549.65	100.00%							
Station Commanders	Supervise police operations	number of police stations	$248,132.02	90.00%							
	Review/correct MPRs	Number of MPRs		10.00%							
Patrolmen	Patrol	Hours on patrol	$999,374.96	90.39%							
	Conduct initial investigations	Number of calls requiring investigation		2.75%							
	Write reports	Number of MPRs		6.42%							
	Mag court support	Number of cases		0.43%							
	Crime prevention education	Number of events supported		0.02%							
Dispatchers	Dispatch officers	hours in a day	$123,182.88	100.00%							
Animal Control	Patrol	Number of animal related calls	$39,172.46	100.00%							
			$2,762,610.23				$32,528.04		$6,385.32		$4,264.56

Phy Security		Supply/Budget		Investigations Dept		Deputy Chief		Training Officer		PAC		Maintenance		Shift Supervisors	
driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost
1.86%	$1,486.01	3.73%	$2,972.02	11.18%	$8,916.05	1.86%	$1,486.01	1.86%	$1,486.01	5.59%	$4,458.02	1.86%	$1,486.01	9.32%	$7,430.04
6.00%	$2,160.44	6.00%	$2,160.44			6.00%	$2,160.44			6.00%	$2,160.44				
0.12%	$41.81	0.23%	$83.62	0.70%	$250.85	0.12%	$41.81	0.12%	$41.81	0.35%	$125.42	0.12%	$41.81	0.58%	$209.04
3.74%	$1,967.67	3.74%	$1,967.67	22.43%	$11,806.04	3.74%	$1,967.67	3.74%	$1,967.67	14.96%	$7,870.69	3.74%	$1,967.67		
							$0.00								
0.19%	$97.45	0.37%	$194.90	1.11%	$584.71	0.19%	$97.45	0.19%	$97.45	0.37%	$194.90	0.09%	$48.73	0.19%	$97.45
1.00%	$2,608.21			9.07%	$23,624.04	1.00%	$2,608.21	1.00%	$2,608.21	3.00%	$7,824.62	1.00%	$2,608.21	5.00%	$13,041.03
1.12%	$762.57									1.92%	$1,307.26				
										15.00%	$10,218.39				
0.19%	$128.53	0.38%	$257.07	1.13%	$771.20	0.19%	$128.53			0.57%	$385.60	0.19%	$128.53	0.94%	$642.67
				20.00%	$5,429.11										
	$9,252.68		$7,635.71		$51,381.99		$8,490.12		$6,201.15		$34,545.34		$6,280.95		$21,420.23

Station Commanders		Patrolmen		Dispatchers		Animal Control		Police Information, Blotters		Information Requests		Police Patrol Service	
driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost
9.32%	$7,430.04	40.99%	$32,692.17	5.59%	$4,458.02	1.86%	$1,486.01						
0.58%	$209.04	2.55%	$919.78	0.35%	$125.42	0.12%	$41.81						
										8.77%	$3,159.30		
3.74%	$1,967.67	14.96%	$7,870.69	3.74%	$1,967.67								
										9.00%	$4,736.14		
0.19%	$97.45	0.19%	$97.45	1.30%	$682.16	0.09%	$48.73						
5.00%	$13,041.03	22.02%	$57,380.55	3.00%	$7,824.62	1.00%	$2,608.21						
								33.43%	$121,751.14				
								5.38%	$19,609.83				
								6.25%	$4,039.75				
0.94%	$642.67	4.15%	$2,827.73	0.57%	$385.60	0.19%	$128.53						
								85.41%	$69,807.59				
										11.22%	$9,172.39		
						5.00%	$1,357.28						
								10.00%	$24,813.20				
												90.39%	$903,358.02
								6.42%	$64,156.00				
												100.00%	$123,182.88
												100.00%	$39,172.46
	$23,387.90		$101,788.38		$15,443.50		$5,670.56		$304,177.51		$17,067.83		$1,065,713.37

Police Ops		Investigations		Crime Prevention Ed		Crime Watch Hot-line		Phy Security Inspect		Magistrate Support		Percent	Cost	
driver	Cost	driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	totals	totals	
												98.75%	$78,758.41	
								1.25%	$996.94			1.25%	$996.94	
												61.07%	$21,990.43	
												24.00%	$8,641.75	
												6.15%	$2,215.83	
												8.77%	$3,159.30	
												86.00%	$45,256.47	
												9.00%	$4,736.14	
												5.00%	$2,631.19	
								80.00%	$49,100.94			80.00%	$49,100.94	
				16.50%	$10,127.07							16.50%	$10,127.07	
						3.50%	$2,148.17					3.50%	$2,148.17	
42.71%	$111,278.58											100.00%	$260,574.09	
		59.79%	$217,755.96									59.79%	$217,755.96	
												33.43%	$121,751.14	
												5.38%	$19,609.83	
												1.33%	CID support =>	$4,856.20
				0.07%	$250.73							0.07%	$250.73	
42.16%	$27,252.77											42.16%	$27,252.77	
								1.01%	$652.57			1.01%	$652.57	
						0.58%	$372.90					0.58%	$372.90	
50.00%	$32,318.00											50.00%	$32,318.00	
												6.25%	$4,039.75	
64.45%	$43,902.02	7.52%	$5,120.09									75.00%	$51,091.93	
												15.00%	$10,218.39	
												10.00%	$6,812.26	
												85.41%	$69,807.59	
												11.22%	$9,172.39	
										3.37%	$2,753.59	3.37%	$2,753.59	
75.00%	$20,359.15											100.00%	$27,145.54	
100.00%	$256,549.65											100.00%	$256,549.65	
90.00%	$223,318.82											90.00%	$223,318.82	
												10.00%	$24,813.20	
												90.39%	$903,358.02	
		2.75%	$27,432.85									2.75%	$27,432.85	
												6.42%	$64,156.00	
										0.43%	$4,262.33	0.43%	$4,262.33	
				0.02%	$165.76							0.02%	$165.76	
												100.00%	$123,182.88	
												100.00%	$39,172.46	
	$714,979.00		$250,308.90		$10,543.55		$2,521.07		$50,750.46		$7,015.92	$2,757,754.04	$2,757,754.04	
													$4,856.20	<= CID support
													$2,762,610.23	

						Cost Matrix			
	Chief	Chief's Secretary	ADP	Phy Security	Supply/Budget	Investigations Dept	Deputy Chief	Training Officer	PAC
Chief	1	-0.611882257	-0.039243156	0	-0.031860984	0	0	-0.001886792	0
Chief's Secretary	-0.018632075	1	-0.041095008	0	-0.010009464	0	0	-0.001886792	0
ADP	-0.018632075	-0.001161103	1	0	-0.010009464	0	0	-0.001886792	0
Phy Security	-0.018632075	-0.061161103	-0.039243156	1	-0.010009464	0	0	-0.013080822	0
Supply/Budget	-0.037264151	-0.062322206	-0.041095008	0	1	0	0	-0.003773585	0
Investigations	-0.111792453	-0.006966618	-0.235458937	0	-0.090661525	1	0	-0.011320755	0
Deputy Chief	-0.018632075	-0.061161103	-0.039243156	0	-0.010009464	0	1	-0.001886792	0
Training Officer	-0.018632075	-0.001161103	-0.039243156	0	-0.010009464	0	0	1	0
PAC	-0.055896226	-0.063483309	-0.153268921	0	-0.030028392	0	0	-0.174850143	1
Maintenance	-0.018632075	-0.001161103	-0.03831723	0	-0.010009464	0	0	-0.001886792	0
Shift Supervisors	-0.093160377	-0.005805515	-0.001851852	0	-0.050047321	0	0	-0.009433962	0
Station Commanders	-0.093160377	-0.005805515	-0.039243156	0	-0.050047321	0	0	-0.009433962	0
Patrolmen	-0.40990566	-0.025544267	-0.151417069	0	-0.22020821	0	0	-0.041509434	0
Dispatchers	-0.055896226	-0.003483309	-0.050354267	0	-0.030028392	0	0	-0.005660377	0
Animal Control	-0.018632075	-0.001161103	-0.000925926	0	-0.010009464	0	0	-0.001886792	0
Police Info, blotters	0	-0.087740385	0	0	0	-0.388115626	-0.0625	0	-0.8540871
Request for info	0	0	-0.09	0	0	0	0	0	-11.22%
Police Patrol Service	0	0	0	0	0	0	0	0	0
Police Ops	0	0	0	0	-0.427051606	0	-0.921634615	-0.64445629	0
Investigations	0	0	0	0	0	-0.597862992	0	-0.075159915	0
Crime Prevention Ed	0	0	0	-0.165	0	-0.000688386	0	0	0
Crime Watch Hot-line	0	0	0	-0.035	0	0	-0.005769231	0	0
Phy Security Inspect	-0.0125	0	0	-0.8	0	0	-0.010096154	0	0
Magistrate Support	0	0	0	0	0	0	0	0	-0.0336898
CID	0	0	0	0	0	-0.013332996	0	0	0
						Inverted cost Matrix			
	1.014389022	0.62321552	0.067164447	0	0.039263445	0	0	0.003364709	0
	0.020133352	1.013071574	0.042965231	0	0.011232579	0	0	0.002072897	0
	0.019361085	0.013685451	1.001844318	0	0.010801725	0	0	0.001993385	0
	0.021553686	0.075165713	0.044197641	1	0.012024997	0	0	0.013392081	0
	0.039926529	0.086976425	0.046506342	0	1.002649336	0	0	0.00411077	0
	0.125967783	0.090838926	0.256428861	0	0.100282657	1	0	0.012969436	0
	0.021328877	0.075006806	0.043737764	0	0.011899573	0	1	0.002195986	0
	0.020082983	0.014195727	0.041082337	0	0.011204478	0	0	1.000184472	0
	0.065656545	0.106339973	0.168613175	0	0.036630381	0	0	0.17563103	1
	0.020102948	0.014209839	0.040232217	0	0.011215617	0	0	0.002069766	0
	0.09684128	0.068452598	0.011076855	0	0.054028627	0	0	0.009970619	0
	0.097565217	0.068964315	0.048537121	0	0.054432517	0	0	0.010045154	0
	0.428875475	0.303152131	0.192271316	0	0.239273509	0	0	0.044156313	0
	0.059058169	0.041745474	0.055980089	0	0.032949087	0	0	0.006080532	0
	0.02038416	0.014408615	0.004783562	0	0.011372507	0	0	0.00209872	0
	0.161363797	0.262485085	0.278249404	0	0.128548389	0.388115626	0.121665373	0.202138097	0.85408709
	0.009110677	0.013165489	0.109088277	0	0.005082929	0	0	0.019889258	0.11222307
	0.69253117	0.562125722	0.389658169	0	0.764815103	0	0.833086735	0.652743678	0
	0.249377911	0.256598677	0.171581042	0	0.557800469	0	0.921634615	0.668918164	0
	0.09543897	0.070741344	0.16638482	0	0.082677101	0.597862992	0.025298875	0.102501623	0
	0.003755568	0.012557716	0.007529482	0.165	0.002185361	0.000688386	0.000152863	0.002336893	0
	0.00087743	0.003063532	0.001799251	0.035	0.000489526	0	0.005769231	0.000481392	0
	0.030138151	0.068680045	0.036639252	0.8	0.01023093	0	0.010096154	0.010777895	0
	0.005104708	0.005969913	0.007232381	0	0.004633591	0	0.00393077	0.008958243	0.03368984
	0.001679528	0.001211155	0.003418965	0	0.001337068	0.013332996	0	0.000172921	0

Maintenance	Shift Supervisors	Station Commanders	Patrolmen	Dispatchers	Animal Control	Police Blotter	Request for info	Police Patrol Service	Police Ops	Investigations
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
-0.2	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0	0	0	0
-0.05	0	0	0	0	1	0	0	0	0	0
0	0	-0.1	-0.064196	0	0	1	0	0	-0.0641961	0
0	0	0	0	0	0	0	1	0	0	0
0	0	0	-0.903923	-1	-1	0	0	1	-0.903923	0
-0.75	-1	-0.9	0	0	0	0	0	0	1	0
0	0	0	-0.02745	0	0	0	0	0	-0.02745	1
0	0	0	-0.000166	0	0	0	0	0	-0.0001659	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	-0.004265	0	0	0	0	0	-0.004265	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0.2	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0	0	0	0
0.05	0	0	0	0	1	0	0	0	0	0
0.12577022	0.064196127	0.157776514	0.0641961	0	0	1	0	0	0.06419613	0
0	0	0	0	0	0	0	1	0	0	0
0.727942257	0.903923009	0.813530708	0.903923	1	1	0	0	1	0.90392301	0
0.75	1	0.9	0	0	0	0	0	0	1	0
0.140160102	0.027450005	0.024705004	0.02745	0	0	0	0	0	0.02745	1
0.000262073	0.000165861	0.000149275	0.0001659	0	0	0	0	0	0.00016586	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0.003198749	0.004264999	0.003838499	0.004265	0	0	0	0	0	0.004265	0
0.002666599	0	0	0	0	0	0	0	0	0	0

Crime Prevent Ed	Hot-line	Phy Security Inspect	Mag Support	CID			Departmental costs	
0	0	0	0	0	$79,755.35		$117,337.97	Chief
0	0	0	0	0	$36,007.31		$43,412.85	Chief's Secretary
0	0	0	0	0	$52,623.81		$57,708.23	ADP
0	0	0	0	0	$61,376.17		$72,173.26	Phy Security
0	0	0	0	0	$260,574.09		$270,307.95	Supply/Budget
0	0	0	0	0	$364,223.85		$423,479.27	Investigations
0	0	0	0	0	$64,635.99		$74,589.84	Deputy Chief
0	0	0	0	0	$68,122.57		$75,329.52	Training Officer
0	0	0	0	0	$81,733.57		$121,181.48	PAC
0	0	0	0	0	$27,145.54		$34,441.18	Maintenance
0	0	0	0	0	$256,549.65		$282,078.65	Shift Supervisors
0	0	0	0	0	$248,132.02		$275,818.80	Station Commanders
0	0	0	0	0	$999,374.96		$1,119,970.33	Patrolmen
0	0	0	0	0	$123,182.88		$141,342.02	Dispatchers
0	0	0	0	0	$39,172.46		$46,032.38	Animal Control
0	0	0	0	0	0		$426,451.61	Police Information, Blotters
0	0	0	0	0	0		$18,793.10	Request for Information
0	0	0	0	0	0		$1,912,821.87	Police Patrol Service
0	0	0	0	0	0		$788,873.07	Police Ops
0	0	0	0	0	0		$311,242.10	Investigations
1	0	0	0	0	0		$12,516.71	Crime Prevention Ed
0	1	0	0	0	0		$2,956.39	Crime Watch Hot-line
0	0	1	0	0	0		$59,958.41	Phy Security Inspect
0	0	0	1	0	0		$12,223.80	Magistrate Support
0	0	0	0	1	0		$5,646.25	CID support
					$2,762,610.23		$2,762,610.23	
0	0	0	0	0				
0	0	0	0	0				
0	0	0	0	0

						Police Information, Blotters		Police Patrol Service		Information Requests	
						driver	cost	driver	cost	driver	cost
				External costs			$0		$3,677		$0.00
Police Ops	$83,970.99	Hours on patrol			90.39%		$0.00	90.39%	$75,903.31		$0.00
		Number of calls requiring investigation			2.75%		$0.00		$0.00		$0.00
		Number of MPRs			6.42%	6.42%	$5,390.61		$0.00		$0.00
		Number of cases			0.43%		$0.00		$0.00		$0.00
		Number of events supported			0.02%		$0.00		$0.00		$0.00
				Departmental costs			$426,451.61		$1,912,821.87		$18,793.10
					Total		$431,842.23		$1,992,402.61		$18,793.10

Investigations		Crime Prevention Ed		Crime Watch Hot-line		Phy Security Inspect		Magistrate Support		
driver	cost	driver	cost	driver	cost	driver	cost	driver	cost	
	$5,516		$0		$0		$0		$0.00	
	$0.00		$0.00		$0.00		$0.00		$0.00	
2.75%	$2,305.00		$0.00		$0.00		$0.00		$0.00	
	$0.00		$0.00		$0.00		$0.00		$0.00	
	$0.00		$0.00		$0.00		$0.00	0.43%	$358.14	
	$0.00	0.02%	$13.93		$0.00		$0.00		$0.00	
	$311,242.10		$12,516.71		$2,956.39		$59,958.41		$12,223.80	Total LEC cost
	$319,063.26		$12,530.64		$2,956.39		$59,958.41		$12,581.94	$2,850,128.56
	11.17%						$5,646.25	<= CID's cost		
975	$327.24						$2,850,128.56	Check sum		
							$2,855,774.81	<from D34		
							85.30%	<= % payroll costs		
							7.78%	<= % external costs		

Product	Total cost	Percentage of total LEC cost	Number of outputs	Cost per output
Police Information				
Blotter Reports	$431,842.23	15.15%	260	$1,660.93
Background Checks/Insurance Report	$18,793.10	0.66%	3,120	$6.02
Police Patrol Services	$1,992,402.61	69.91%	30,520	$65.28
Investigations	$319,063.26	11.19%	975	$327.24
Physical Security Inspections	$59,958.41	2.10%	47	$1,275.71
Crimes Prevention Education	$12,530.64	0.44%	25	$501.23
Crime Watch Hot-line	$2,956.39	0.10%	26	$113.71
U.S. Magistrate Court Support	$12,581.94	0.44%	36	$349.50

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